

In the claims:

DO NOT ENTER: /PDM/ (06/05/2009)

1. **(currently amended)** A concentrated aqueous polymer dispersion with an average particle size of less than 1000 nm comprising

- a) a polymer carrier prepared by heterophase oil in water radical polymerization of at least one ethylenically unsaturated monomer selected from the group consisting of C<sub>1</sub>-C<sub>18</sub>acrylates, C<sub>1</sub>-C<sub>18</sub>methacrylates, acrylic acid, (meth)acrylic acid, styrene, vinyltoluene, hydroxy-functional acrylates, hydroxy-functional (meth)acrylates, acrylates derived from alkoxyated alcohols, (meth)acrylates derived from alkoxyated alcohols, multifunctional acrylates and multifunctional (meth)acrylates in the presence of
- b) a non-polar organic light stabilizer, 1 wherein the non-polar organic light stabilizer has a water solubility of less than 1 % by weight at room temperature and atmospheric pressure,

wherein the weight ratio of non-polar organic light stabilizer to polymer carrier is greater than 100 parts of light stabilizer per 100 parts of carrier and the total solids content of the aqueous polymer dispersion is more than 20% by weight based on the total weight of the aqueous polymer dispersion.

2. **(original)** A concentrated aqueous polymer dispersion according to claim 1 comprising additionally a non-ionic, cationic or anionic surfactant.

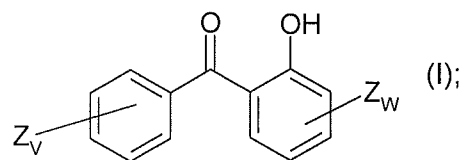
3. **(previously presented)** A concentrated aqueous polymer dispersion according to claim 1 wherein the weight ratio of non-polar organic light stabilizer to polymer carrier is equal or greater than 120 parts per 100 parts.

4. **(original)** A concentrated aqueous polymer dispersion according to claim 1 wherein the average particle size is less than 500 nm.

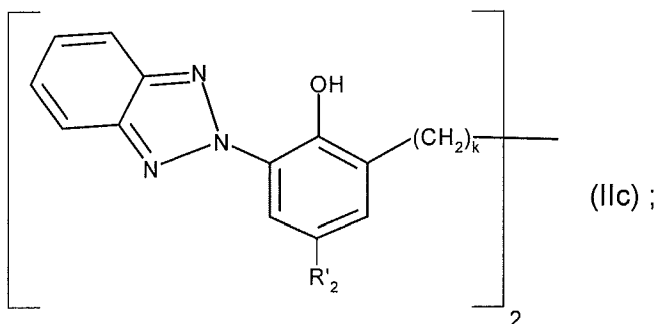
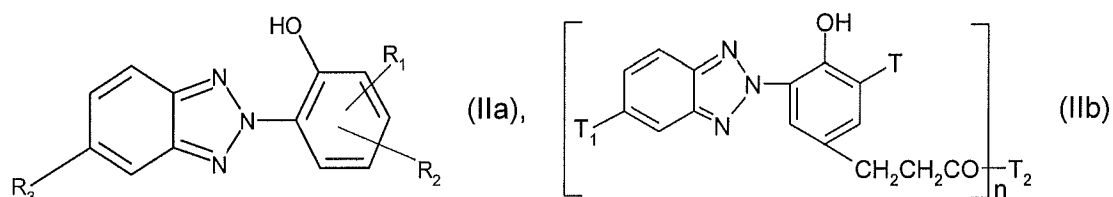
5. **(original)** A concentrated aqueous polymer dispersion according to claim 1 wherein the non-polar organic light stabilizer is selected from the group consisting of a hydroxyphenyl benzotriazol UV-absorber, a hydroxyphenyl triazine UV-absorber, a hydroxybenzophenone UV-absorber, an oxalic anilide UV-absorber and a sterically hindered amine light stabilizer or mixtures thereof.

6-7. **(cancelled)**

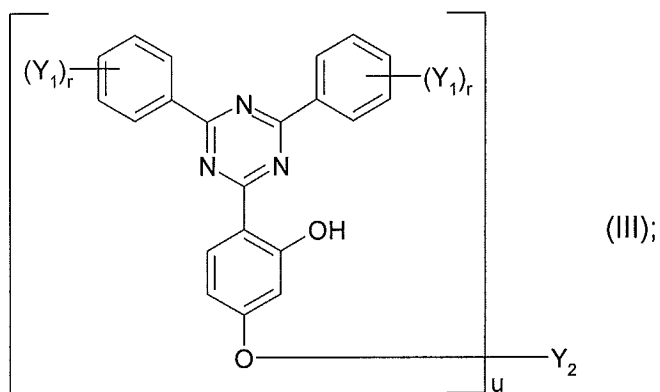
8. **(original)** A concentrated aqueous polymer dispersion according to claim 5 wherein the hydroxybenzophenone is of formula I



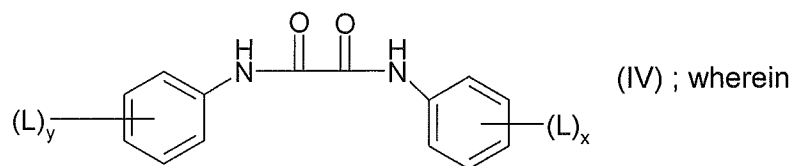
the 2-hydroxyphenylbenzotriazole is of formula IIa, IIb or IIc



the 2-hydroxyphenyltriazine is of formula III



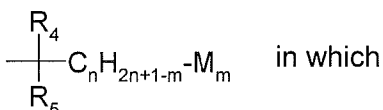
and the oxanilide is of formula (IV)



in the compounds of the formula (I)  $v$  is an integer from 1 to 3 and  $w$  is 1 or 2 and the substituents  $Z$  independently of one another are hydrogen, halogen, hydroxyl or alkoxy having 1 to 12 carbon atoms;

in the compounds of the formula (IIa),

$R_1$  is hydrogen, alkyl having 1 to 24 carbon atoms, phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety, cycloalkyl having 5 to 8 carbon atoms or a radical of the formula



$R_4$  and  $R_5$  independently of one another are alkyl having in each case 1 to 5 carbon atoms, or  $R_4$ , together with the radical  $C_n H_{2n+1-m}$ , forms a cycloalkyl radical having 5 to 12 carbon atoms,  $m$  is 1 or 2,  $n$  is an integer from 2 to 20 and

$M$  is a radical of the formula  $-COOR_6$  in which

$R_6$  is hydrogen, alkyl having 1 to 12 carbon atoms, alkoxyalkyl having in each case 1 to 20 carbon atoms in the alkyl moiety and in the alkoxy moiety or phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety,

$R_2$  is hydrogen, halogen, alkyl having 1 to 18 carbon atoms, and phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety, and

$R_3$  is hydrogen, chlorine, alkyl or alkoxy having in each case 1 to 4 carbon atoms or  $-COOR_6$  in which  $R_6$  is as defined above, at least one of the radicals  $R_1$  and  $R_2$  being other than hydrogen;

in the compounds of the formula (IIb)

$T$  is hydrogen or alkyl having 1 to 6 carbon atoms,

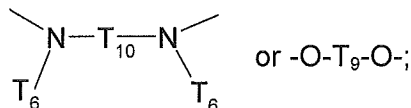
$T_1$  is hydrogen, chlorine or alkyl or alkoxy having in each case 1 to 4 carbon atoms,

$n$  is 1 or 2 and,

if  $n$  is 1,

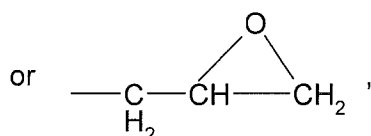
$T_2$  is chlorine or a radical of the formula  $-OT_3$  or  $\begin{array}{c} T_4 \\ \diagup \\ -N \\ \diagdown \\ T_5 \end{array}$  and,

if n is 2, T<sub>2</sub> is a radical of the formula



in which

T<sub>3</sub> is hydrogen, alkyl which has 1 to 18 carbon atoms and is unsubstituted or substituted by 1 to 3 hydroxyl groups or by -OCOT<sub>6</sub>, alkyl which has 3 to 18 carbon atoms, is interrupted once or several times by -O- or -NT<sub>6</sub>- and is unsubstituted or substituted by hydroxyl or -OCOT<sub>6</sub>, cycloalkyl which has 5 to 12 carbon atoms and is unsubstituted or substituted by hydroxyl and/or alkyl having 1 to 4 carbon atoms, alkenyl which has 2 to 18 carbon atoms and is unsubstituted or substituted by hydroxyl, phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety, or a radical of the formula -CH<sub>2</sub>CH(OH)-T<sub>7</sub>



T<sub>4</sub> and T<sub>5</sub> independently of one another are hydrogen, alkyl having 1 to 18 carbon atoms, alkyl which has 3 to 18 carbon atoms and is interrupted once or several times by -O- or

-NT<sub>6</sub>-, cycloalkyl having 5 to 12 carbon atoms, phenyl, phenyl which is substituted by alkyl having 1 to 4 carbon atoms, alkenyl having 3 to 8 carbon atoms, phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety or hydroxyalkyl having 2 to 4 carbon atoms,

T<sub>6</sub> is hydrogen, alkyl having 1 to 18 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, alkenyl having 3 to 8 carbon atoms, phenyl, phenyl which is substituted by alkyl having 1 to 4 carbon atoms, phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety,

T<sub>7</sub> is hydrogen, alkyl having 1 to 18 carbon atoms, phenyl which is unsubstituted or substituted by hydroxyl, phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety, or -CH<sub>2</sub>OT<sub>8</sub>,

T<sub>8</sub> is alkyl having 1 to 18 carbon atoms, alkenyl having 3 to 8 carbon atoms, cycloalkyl having 5 to 10 carbon atoms, phenyl, phenyl which is substituted by alkyl having 1 to 4 carbon atoms, or phenylalkyl having 1 to 4 carbon atoms in the alkyl moiety,

T<sub>9</sub> is alkylene having 2 to 8 carbon atoms, alkenylene having 4 to 8 carbon atoms, alkynylene having 4 carbon atoms, cyclohexylene, alkylene which has 2 to 8 carbon atoms and is interrupted once or several times by -O-, or a radical of the formula -CH<sub>2</sub>CH(OH)CH<sub>2</sub>OT<sub>11</sub>OCH<sub>2</sub>CH(OH)CH<sub>2</sub>- or -CH<sub>2</sub>-C(CH<sub>2</sub>OH)<sub>2</sub>-CH<sub>2</sub>-,

T<sub>10</sub> is alkylene which has 2 to 20 carbon atoms and can be interrupted once or several times by -O-, or cyclohexylene,

T<sub>11</sub> is alkylene having 2 to 8 carbon atoms, alkylene which has 2 to 18 carbon atoms and is interrupted once or several times by -O-, 1,3-cyclohexylene, 1,4-cyclohexylene, 1,3-phenylene or 1,4-phenylene, or

T<sub>10</sub> and T<sub>6</sub>, together with the two nitrogen atoms, are a piperazine ring;

in the compounds of formula (IIc)

R'<sub>2</sub> is C<sub>1</sub>-C<sub>12</sub>alkyl and k is a number from 1 to 4;

in the compounds of the formula (III)

u is 1 or 2 and r is an integer from 1 to 3, the substituents

Y<sub>1</sub> independently of one another are hydrogen, hydroxyl, phenyl or halogen, halogenomethyl, alkyl having 1 to 12 carbon atoms, alkoxy having 1 to 18 carbon atoms, alkoxy having 1 to 18 carbon atoms which is substituted by a group -COO(C<sub>1</sub>-C<sub>18</sub>alkyl);

if u is 1,

Y<sub>2</sub> is alkyl having 1 to 18 carbon atoms, phenyl which is unsubstituted or substituted by hydroxyl, halogen, alkyl or alkoxy having 1 to 18 carbon atoms;

alkyl which has 1 to 12 carbon atoms and is substituted by -COOH, -COOY<sub>8</sub>, -CONH<sub>2</sub>, -CONHY<sub>9</sub>, -CONY<sub>9</sub>Y<sub>10</sub>, -NH<sub>2</sub>, -NHY<sub>9</sub>, -NY<sub>9</sub>Y<sub>10</sub>, -NHCOY<sub>11</sub>, -CN and/or -OCOY<sub>11</sub>;

alkyl which has 4 to 20 carbon atoms, is interrupted by one or more oxygen atoms and is unsubstituted or substituted by hydroxyl or alkoxy having 1 to 12 carbon atoms, alkenyl having 3 to 6 carbon atoms, glycidyl, cyclohexyl which is unsubstituted or substituted by hydroxyl, alkyl having 1 to 4 carbon atoms and/or -OCOY<sub>11</sub>, phenylalkyl which has 1 to 5 carbon atoms in the alkyl moiety and is unsubstituted or substituted by hydroxyl, chlorine and/or methyl, -COY<sub>12</sub> or -SO<sub>2</sub>Y<sub>13</sub>, or,

if u is 2,

Y<sub>2</sub> is alkylene having 2 to 16 carbon atoms, alkenylene having 4 to 12 carbon atoms, xylylene, alkylene which has 3 to 20 carbon atoms, is interrupted by one or more -O- atoms and/or is substituted by hydroxyl, -CH<sub>2</sub>CH(OH)CH<sub>2</sub>-O-Y<sub>15</sub>-OCH<sub>2</sub>CH(OH)CH<sub>2</sub>, -CO-Y<sub>16</sub>-CO-, -CO-NH-Y<sub>17</sub>-NH-CO- or -(CH<sub>2</sub>)<sub>m</sub>-CO<sub>2</sub>-Y<sub>18</sub>-OCO-(CH<sub>2</sub>)<sub>m</sub>, in which

m is 1, 2 or 3,

Y<sub>8</sub> is alkyl having 1 to 18 carbon atoms, alkenyl having 3 to 18 carbon atoms, alkyl which has 3 to 20 carbon atoms, is interrupted by one or more oxygen or sulfur atoms or -NT<sub>6</sub>- and/or is substituted by hydroxyl, alkyl which has 1 to 4 carbon atoms and is substituted by -P(O)(OY<sub>14</sub>)<sub>2</sub>, -NY<sub>9</sub>Y<sub>10</sub> or -OCOY<sub>11</sub> and/or hydroxyl, alkenyl having 3 to 18 carbon atoms, glycidyl, or phenylalkyl having 1 to 5 carbon atoms in the alkyl moiety,

$Y_9$  and  $Y_{10}$  independently of one another are alkyl having 1 to 12 carbon atoms, alkoxyalkyl having 3 to 12 carbon atoms, dialkylaminoalkyl having 4 to 16 carbon atoms or cyclohexyl having 5 to 12 carbon atoms, or  $Y_9$  and  $Y_{10}$  together are alkylene, oxaalkylene or azaalkylene having in each case 3 to 9 carbon atoms,

$Y_{11}$  is alkyl having 1 to 18 carbon atoms, alkenyl having 2 to 18 carbon atoms or phenyl,

$Y_{12}$  is alkyl having 1 to 18 carbon atoms, alkenyl having 2 to 18 carbon atoms, phenyl, alkoxy having 1 to 12 carbon atoms, phenoxy, alkylamino having 1 to 12 carbon atoms or phenylamino,

$Y_{13}$  is alkyl having 1 to 18 carbon atoms, phenyl or alkylphenyl having 1 to 8 carbon atoms in the alkyl radical,

$Y_{14}$  is alkyl having 1 to 12 carbon atoms or phenyl,

$Y_{15}$  is alkylene having 2 to 10 carbon atoms, phenylene or a group -phenylene-M-phenylene- in which M is -O-, -S-, -SO<sub>2</sub>-, -CH<sub>2</sub>- or -C(CH<sub>3</sub>)<sub>2</sub>-,

$Y_{16}$  is alkylene, oxaalkylene or thiaalkylene having in each case 2 to 10 carbon atoms, phenylene or alkenylene having 2 to 6 carbon atoms,

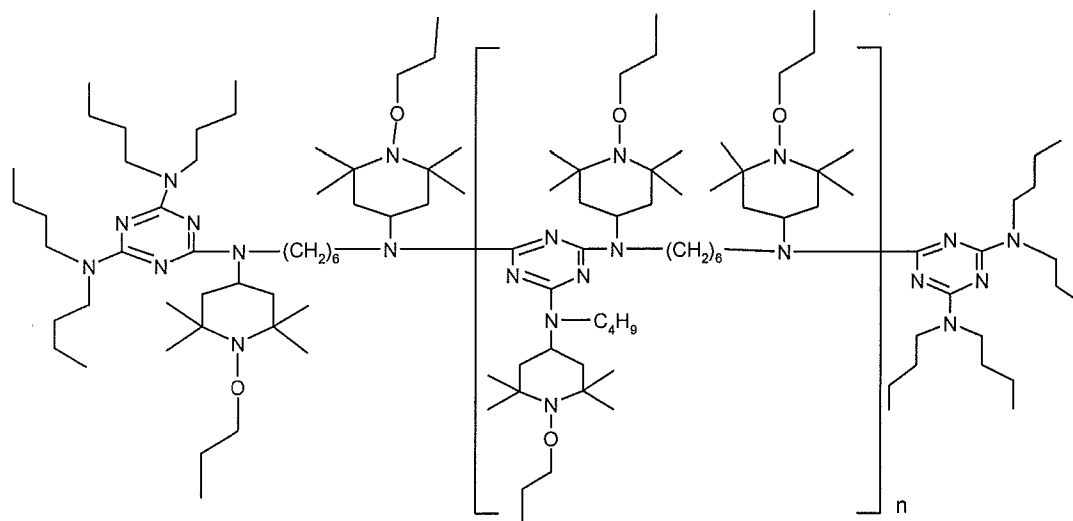
$Y_{17}$  is alkylene having 2 to 10 carbon atoms, phenylene or alkylphenylene having 1 to 11 carbon atoms in the alkyl moiety, and

$Y_{18}$  is alkylene having 2 to 10 carbon atoms or alkylene which has 4 to 20 carbon atoms and is interrupted once or several times by oxygen;

in the compounds of the formula (IV) x is an integer from 1 to 3 and the substituents L independently of one another are hydrogen, alkyl, alkoxy or alkylthio having in each case 1 to 22 carbon atoms, phenoxy or phenylthio.

9. **(previously presented)** A concentrated aqueous polymer dispersion according to claim 5 wherein the sterically hindered amine is selected from the group consisting of bis(2,2,6,6-tetramethyl-4-piperidyl)sebacate, bis(2,2,6,6-tetramethyl-4-piperidyl)succinate, bis(1,2,2,6,6-pentamethyl-4-piperidyl)sebacate, bis(1-octyloxy-2,2,6,6-tetramethyl-4-piperidyl)sebacate, bis(1,2,2,6,6-pentamethyl-4-piperidyl) n-butyl-3,5-di-tert-butyl-4-hydroxybenzylmalonate, the condensate of 1-(2-hydroxyethyl)-2,2,6,6-tetramethyl-4-hydroxypiperidine and succinic acid, linear or cyclic condensates of N,N'-bis(2,2,6,6-tetramethyl-4-piperidyl)hexamethylenediamine and 4-tert-octylamino-2,6-dichloro-1,3,5-triazine, tris(2,2,6,6-tetramethyl-4-piperidyl)nitritotriacetate, tetrakis(2,2,6,6-tetramethyl-4-piperidyl)-1,2,3,4-butane-tetracarboxylate, 1,1'-(1,2-ethanediyl)-bis(3,3,5,5-tetramethylpiperazinone), 4-benzoyl-2,2,6,6-tetramethylpiperidine, 4-stearyloxy-2,2,6,6-tetramethylpiperidine, bis(1,2,2,6,6-pentamethylpiperidyl)-2-n-butyl-2-(2-hydroxy-3,5-di-tert-butylbenzyl)malonate, 3-n-octyl-7,7,9,9-tetramethyl-1,3,8-triazaspiro[4.5]decan-2,4-dione, bis(1-octyloxy-2,2,6,6-

tetramethylpiperidyl)succinate, linear or cyclic condensates of N,N'-bis-(2,2,6,6-tetramethyl-4-piperidyl)hexamethylenediamine and 4-morpholino-2,6-dichloro-1,3,5-triazine, the condensate of 2-chloro-4,6-bis(4-n-butylamino-2,2,6,6-tetramethylpiperidyl)-1,3,5-triazine and 1,2-bis(3-aminopropylamino)ethane, the condensate of 2-chloro-4,6-di-(4-n-butylamino-1,2,2,6,6-pentamethylpiperidyl)-1,3,5-triazine and 1,2-bis-(3-aminopropylamino)ethane, 8-acetyl-3-dodecyl-7,7,9,9-tetramethyl-1,3,8-triazaspiro[4.5]decane-2,4-dione, 3-dodecyl-1-(2,2,6,6-tetramethyl-4-piperidyl)pyrrolidin-2,5-dione, 3-dodecyl-1-(1,2,2,6,6-pentamethyl-4-piperidyl)pyrrolidine-2,5-dione, a mixture of 4-hexadecyloxy- and 4-stearyloxy-2,2,6,6-tetramethylpiperidine, a condensation product of N,N'-bis(2,2,6,6-tetramethyl-4-piperidyl)hexamethylenediamine and 4-cyclohexylamino-2,6-dichloro-1,3,5-triazine, a condensation product of 1,2-bis(3-aminopropylamino)ethane and 2,4,6-trichloro-1,3,5-triazine as well as 4-butylamino-2,2,6,6-tetramethylpiperidine; N-(2,2,6,6-tetramethyl-4-piperidyl)-n-dodecylsuccinimide, N-(1,2,2,6,6-pentamethyl-4-piperidyl)-n-dodecylsuccinimide, 2-undecyl-7,7,9,9-tetramethyl-1-oxa-3,8-diaza-4-oxo-spiro[4,5]decane, a reaction product of 7,7,9,9-tetramethyl-2-cycloundecyl-1-oxa-3,8-diaza-4-oxospiro [4,5]decane und epichlorohydrin, 1,1-bis(1,2,2,6,6-pentamethyl-4-piperidyl)oxycarbonyl)-2-(4-methoxyphenyl)ethene, N,N'-bis-formyl-N,N'-bis(2,2,6,6-tetramethyl-4-piperidyl)hexamethylenediamine, diester of 4-methoxy-methylene-malonic acid with 1,2,2,6,6-pentamethyl-4-hydroxypiperidine, poly[methylpropyl-3-oxy-4-(2,2,6,6-tetramethyl-4-piperidyl)]siloxane and reaction product of maleic acid anhydride- $\alpha$ -olefin-copolymer with 2,2,6,6-tetramethyl-4-aminopiperidine, 1,2,2,6,6-pentamethyl-4-aminopiperidine, 2,4-bis[N-(1-cyclohexyloxy-2,2,6,6-tetramethylpiperidine-4-yl)-N-butyl-amino]-6-(2-hydroxyethyl)amino-1,3,5-triazine, 1-(2-Hydroxy-2-methylpropoxy)-4-octadecanoyloxy-2,2,6,6-tetramethylpiperidine, 5-(2-ethylhexanoyl)oxymethyl-3,3,5-trimethyl-2-morpholinone or a compound



in which n is from 1 to 15.

10. **(previously presented)** A process for the preparation of a concentrated aqueous polymer dispersion with an average particle size of less than 1000 nm comprising the step of polymerizing at least one ethylenically unsaturated monomer in the presence of a non-polar organic light stabilizer by heterophase radical polymerization; wherein the weight ratio of non-polar organic light stabilizer to polymer carrier formed from the ethylenically unsaturated monomer is greater than 100 parts of light stabilizer per 100 parts of polymer carrier.

11. **(previously presented)** A process according to claim 10 comprising the steps of

- a) dissolving, emulsifying or dispersing a non-polar organic light stabilizer in at least one ethylenically unsaturated monomer;
- b) preparing a conventional oil in water emulsion of said light stabilizer dissolved, emulsified or dispersed in at least one ethylenically unsaturated monomer;
- c) homogenizing the conventional emulsion to a miniemulsion wherein the droplets of the organic phase have an average diameter below 1000 nm;
- d) polymerizing the miniemulsion by adding a polymerization initiator;

wherein the weight ratio of non-polar organic light stabilizer to polymer carrier formed from the ethylenically unsaturated monomer is greater than 100 parts of light stabilizer per 100 parts of polymer carrier.

12. **(original)** A polymer powder obtainable by vaporizing the volatile components of the concentrated aqueous polymer dispersion according to claim 1.

13. **(original)** A composition stabilized against thermal, oxidative or light-induced degradation which comprises,

- (a) an organic material susceptible to thermal, oxidative or light induced degradation, and
- (b) a concentrated aqueous polymer dispersion according to claim 1.

14. **(original)** A composition according to claim 13 wherein the amount of component b) is from 0.1 to 40% by weight based on the weight of the solid content of component a).

15. **(original)** A composition according to claim 13 wherein the organic material is a recording material.



16. **(original)** A composition according to claim 15 wherein the recording material is a photographic material or an ink jet material.
17. **(original)** A composition according to claim 15 wherein the recording material is a printed material containing the concentrated aqueous polymer dispersion in an overprint varnish.
18. **(previously presented)** A composition according to claim 13 wherein the organic material (a) is an adhesive, an aqueous emulsion of a natural or synthetic rubber, a water based ink or a water based coating.
19. **(cancelled).**
20. **(original)** A powder coating composition stabilized against thermal, oxidative or light-induced degradation comprising
- a) a solid binder material; and
  - b) a polymer powder according to claim 12.
21. **(original)** A composition stabilized against thermal, oxidative or light-induced degradation comprising
- a) a thermoplastic polymer and
  - b) a polymer powder according to claim 12.
22. **(previously presented)** A method of stabilizing an organic material susceptible to thermal, oxidative or light induced degradation, which comprises incorporating therein a stabilizingly effective amount of a concentrated aqueous polymer dispersion according to claim 1.
23. **(previously presented)** A method of stabilizing a powder coating against thermal, oxidative or light-induced degradation, which comprises incorporating therein a stabilizingly effective amount of a polymer powder according to claim 12.
24. **(new)** A concentrated aqueous polymer dispersion according to claim 1 wherein the dispersion contains 20% by weight or more of the light stabilizer b) based on the total weight of the dispersion.